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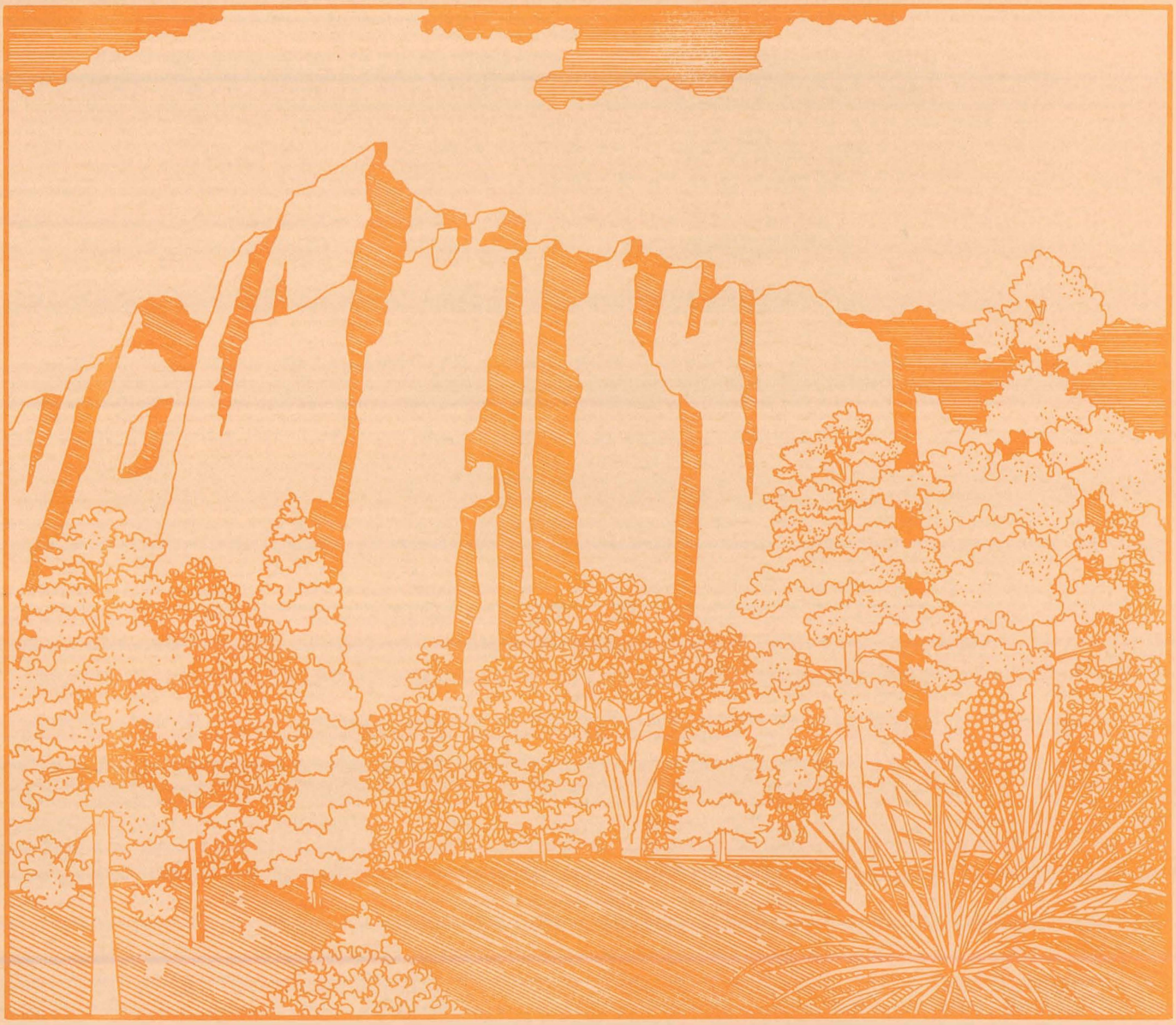
Forest Pest Management Report

R-3 81-10

BIOLOGICAL EVALUATION
Dwarf Mistletoe in Horsethief Basin
Summer Home Area

Bradshaw Ranger District,
Prescott National Forest, Arizona

May 1981



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Forest Pest Management
State and Private Forestry
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INTRODUCTION

Horsethief Basin is located at the southern end of the Bradshaw Mountains in west-central Arizona. Located at an altitude of 6,000 feet, the Basin averages 26 inches of precipitation a year. The predominant vegetation type is ponderosa pine as an overstory, with Gambel oak, ponderosa pine, alligator juniper, and manzanita making up the understory. Part of the Basin was developed in the 1930's by the City of Phoenix as a recreation area for heat-struck Phoenicians, and over a million dollars were spent on development of the area by Phoenix and the Public Works Administration. The summer home area of the Basin is made up of 55 lots, averaging 1/4-acre in size; 33 are developed sites administered by the USDA Forest Service under individual Special Use Permits.

THE PROBLEM

Horsethief Basin has a long history of southwestern dwarf mistletoe and Ips bark beetle activity, and the summer home area is no exception. A majority of the lots have a mistletoe-infected pine overstory and understory with infection intensities ranging from moderate to heavy. On some lots, every tree is infected. The deleterious effects of dwarf mistletoe on the growth and vigor of ponderosa pine have been well documented. Infected trees are less healthy and vigorous than uninfected trees; dwarf mistletoe stresses the trees and makes them more susceptible to attack by bark beetles, environmental stresses such as drought, invasion by wood decay fungi that contributes to stem failure, and direct mortality. Another significant impact is due to the fact that dwarf mistletoe infections in the overstory result in infection and eventual destruction of most, if not all, of the understory trees of susceptible species. This process is already well advanced on many of the developed sites--lots that, because of construction damage, already have a sparse understory. This understory component is especially valuable in a heavily used recreation area because of its value as (1) a source for overstory replacement, (2) screening between lots, (3) shading, and (4) aesthetics.

Management of pine in recreation areas can best be described as an attempt to maintain a healthy, vigorous, all-aged, mixed species, properly stocked stand with numerous old-growth trees. The summer home area is a diseased, declining, even-aged, single species, understocked stand with the few old-growth trees heavily infected with dwarf mistletoe. There are several control methods available for dealing with dwarf mistletoe infected stands. Because mistletoe is an obligate parasite, all of these options are based upon cutting or pruning trees.

CONTROL METHODS

1. Pruning of witches' brooms from overstory trees to restore vigor. This option has been used in other recreation areas to increase the life span of infected valuable trees. Removal of the broom removes a large nutrient sink from the tree and in many cases can return the tree to full vigor. The life span of trees can be increased up to 20 years. Care must be taken to injure the tree as little as possible when climbing and cutting brooms.

2. Pruning of individual infected branches in the understory. This option is used when lightly infected trees can be sanitized and have a good chance of not being reinfected.

3. Sanitation and thinning of the understory. Heavily infected trees are removed along with excess stems. The success of this option depends on the presence of an adequately stocked understory. On many lots, there may be no choice other than to leave infected trees because of a lack of replacement trees.

4. Overstory removal. An infected overstory represents a major source of future infections in both the overstory and understory of susceptible species. If infected overstory trees are left, any control activity in the understory to control dwarf mistletoe must be considered a waste of time. In recreation areas, this option should be used only as a last resort because of the high value of large, old-growth trees. If there is no understory, however, there is no need to remove the infected trees because, not only is there nothing to replace them, there is also nothing for them to infect.

5. Underplanting of resistant species. Southwestern dwarf mistletoe is host specific. Douglas-fir, white fir, white pine, oaks, junipers, and other native and exotic species can be planted under infected pines with no danger of the planted stock becoming infected. Ponderosa pine should be planted only in areas where no infected overstory trees are present.

ALTERNATIVES

1. Do nothing. The infected trees will continue to decline, scattered mortality of heavily infected overstory trees will increase, the understory will continue to deteriorate, and the stand will be under an ever increasing threat of catastrophic losses due to bark beetle attacks.

2. Initiate a control project to sanitize the area as much as possible using all or a combination of the control methods listed above. The goal of the project would not be to eradicate dwarf mistletoe from the area; there are too many valuable infected trees with no replacements

for eradication to be feasible. However, by selectively cutting some trees and pruning witches' brooms and infected limbs, the health and vigor of individual trees, as well as the stand as a whole, can be improved.

RECOMMENDATIONS

I recommend alternative 2. In April of 1981, personnel from Forest Pest Management (FPM) and the Prescott National Forest examined all of the lots in the summer home area and marked individual trees for treatment--143 for removal and 167 for broom and branch pruning. For administrative purposes, the lots were divided into two groups: group I consists of lots 1-22 and 41 and 42; group II consists of lots 23-55, excluding 41 and 42. In marking trees for removal, any tree that was questionable, had no replacement, or whose removal would cause property damage, was not marked. A special effort was made to minimize the visual impact of the project. As a result, many trees were left that will continue to decline and may die in the near future, and in spite of any efforts there are some lots where the majority of the trees are essentially terminal as far as dwarf mistletoe is concerned. Other options other than cutting and/or pruning must be considered in these cases (see option 5). If the project alternative is chosen, a schedule of regular examinations and treatments should be planned for the future. It is much easier to maintain a healthy stand of trees than to take action only when a crisis occurs. Technical assistance and funds for dwarf mistletoe control in recreation areas are available from FPM on request.